

3596.02-2

30

PATENT
0002-2IN THE CLAIMS:

Please amend Claim 1 as follows based on the status of Claim 1 after the filing of Applicant's supplemental amendment B telefaxed on March 25, 2001.

1. (Three Times Amended) A combustible fuel composition of diesel fuel and additive as a clear microemulsion with water present wherein said additive comprises:

- (a) [one or more alcohols selected from the group consisting of]
 - [(i) ethanol in an anhydrous state]
 - [(ii)] ethanol having between 0.5%-25% water by volume of ethanol
 - [(iii) anhydrous or aqueous ethanol of subpart (a)(i) or (a)(ii) with methanol up to 5% by volume of ethanol];
- (b) one or more alcohols selected from the group consisting of:
 - (i) straight- or branched-chain alcohols having between 3 and 5 carbon atoms,
 - (ii) straight- or branched-chain alcohols having between 6 and 12 carbon atoms, and
 - (iii) combinations of b(i) and b(ii);
- (c) a fatty acid of the structure $R-(C=O)-OH$, wherein R is alkyl or alkylene having between about 10 to 24 carbon atoms, in combination with ammonia or urea in an anhydrous state or as an aqueous solution;

[(d) optionally one or more ethoxylated alcohols having between 12 and 16 carbon atoms wherein the ethylene oxide add-on is less than 5 moles are not present];

wherein components a, b, and c, [and optionally d thereof] as the additive when combined with mixing with diesel fuel form a clear, stable microemulsion fuel composition having a viscosity within $\pm 10\%$ of the original viscosity of the diesel fuel, and wherein the ratio of diesel fuel to additive ranges from about 50:50 to 99:1 by volume, with the [proviso] proviso that water is present in the composition sufficient to form the microemulsion and with the proviso ethylene oxide condensation and ethylene oxide esterification products are completely eliminated.

59. (Amended) A combustible fuel composition of diesel fuel and additive as a clear microemulsion with water present wherein said additive comprises:

- (a) ethanol having between 0.5%-25% water by volume of ethanol;
- (b) one or more alcohols selected from the group consisting of:
 - (i) straight- or branched-chain alcohols having between 3 and 5 carbon atoms,
 - (ii) straight- or branched-chain alcohols having between 6 and 12 carbon atoms, and
 - (iii) combinations of b(i) and b(ii);
- (c) a fatty acid of the structure $R-(C=O)-OH$, wherein R is alkyl or alkylene having between about 10 to 24 carbon atoms, in combination with ammonia or urea in an anhydrous

F

3596.02-2

31

PATENT
0002-2

state or as an aqueous solution; wherein components a, b, and c, as the additive when combined with mixing with diesel fuel form a clear, stable microemulsion fuel composition having a viscosity within $\pm 10\%$ of the original viscosity of the diesel fuel, and wherein the ratio of diesel fuel to additive ranges from about 50:50 to 99:1 by volume, with the proviso that water is present in the composition sufficient to form the microemulsion and with the proviso ethylene oxide condensation and ethylene oxide esterification products are completely eliminated. [The additive of Claim 1] wherein:

in subpart (a) the alcohol [of

(a)(i) is anhydrous ethanol,

(a)(ii)] is ethanol having between 0.5% and 5% water by volume of ethanol[.]

[(a)(iii) is anhydrous or aqueous ethanol of subpart (a)(i) or (a)(ii) with methanol up to 5% by volume of ethanol];

in subpart (b) the alcohol of

(b)(i) is straight- or branched-chain alcohols having between 3 and 5 carbon atoms,

(b)(ii) is straight- or branched-chain alcohols having between 6 and 12 carbon atoms, or

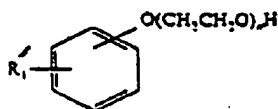
(b)(iii) is combinations of b(i) and b(ii); and

in subpart (c) the ammonia or urea is present sufficient to neutralize about 40-80% of the fatty acid and

[with the proviso that subpart (d) is excluded.]

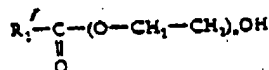
completely eliminated are the following compounds:

the ethylene oxide condensation or esterification product formed with (i) an alkyl phenol of the formula:



where R' is a alkyl chain having up to 8 carbon atoms and n is an integer from 5 to 20:

(ii) a fatty acid of the formula:



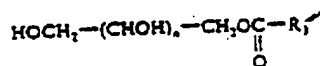
F

3596.02-2

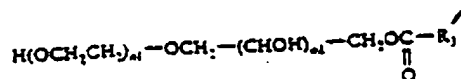
32

PATENT
0002-2(iii) a fatty alcohol of the formula:

wherein R'_1 is a long-chain, saturated or unsaturated hydrocarbon radical containing 12 to 18 carbon atoms, and n is an integer from 5 to 30;

(iv) a polyol having the formula:

wherein R'_2 is a long-chain, saturated or unsaturated hydrocarbon radical containing 12 to 18 carbon atoms, and n is an integer from 1 to 4; or

(v) a polyol and long-chain fatty acid having the formula:

wherein R'_3 has the meaning given above, n , is an integer from 5 to 30 and m , is an integer from 1 to 4.

60. (Amended) The additive of Claim [1] 59 wherein:

[in subpart (a) the alcohol of

(a)(i) is anhydrous ethanol,

(a)(ii) is ethanol having between 0.5% and 5% water by volume of ethanol,

(a)(iii) is anhydrous or aqueous ethanol of subpart (a)(i) or (a)(ii) with methanol up to 5% by volume of ethanol];

in subpart (b) the alcohol of

(b)(i) is straight- or branched-chain alcohols having between 3 and 5 carbon atoms, with the proviso that

(b)(ii) is excluded, and

(b)(iii) is excluded[;

in subpart (c) the ammonia or urea is present sufficient to neutralize

about 40-80% of the fatty acid; and with the proviso that subpart (d) is excluded].

F

3596.02-2

33

PATENT
0002-2

61. (Amended) The additive of Claim [1] 59 wherein [in subpart (a) the alcohol of
(a)(i) is anhydrous ethanol,
(a)(ii) is ethanol having between 0.5% and 5% water by volume of ethanol,
(a)(iii) is anhydrous or aqueous ethanol of subpart (a)(i) or (a)(ii)
with methanol up to 5% by volume of ethanol;]

in subpart (b) the alcohol [of with the proviso that]

(b)(i) is excluded,
(b)(ii) is straight- or branched-chain alcohols having between 6 and 12
carbon atoms, and [with the proviso that]
(b)(iii) is excluded[; and

in subpart

(c) the ammonia or urea is present sufficient to neutralize about 40-80% of the fatty
acid; with the proviso that subpart (d) is excluded].

62. (Amended) The additive of Claim [1] 59 wherein:
the ratio of subparts (a):(b):(c) is between about 50:45:5 to 50:25:25

63. (Amended) The additive of Claim [1] 59 wherein:
the ratio of subparts (a):(b):(c) is between about 60:35:5 to 60:20:20

64. (Amended) A combustible fuel composition of diesel fuel and additive as a clear
microemulsion with water present wherein said additive comprises:

(a) ethanol having between 0.5%-10% water by volume of ethanol;

(b) one or more alcohols selected from the group consisting of:

(i) straight- or branched-chain alcohols having between 3 and 5 carbon atoms,

(ii) straight- or branched-chain alcohols having between 6 and 12 carbon atoms, and

(iii) combinations of b(i) and b(ii);

(c) a fatty acid of the structure R-(C=O)-OH, wherein R is alkyl or alkylene having
between about 10 to 24 carbon atoms, in combination with ammonia or urea in an anhydrous
state or as an aqueous solution and the ammonia or urea is present sufficient to neutralize
about 40-80% of the fatty acid; wherein components a, b, and c, as the additive when combined
with mixing with diesel fuel form a clear, stable microemulsion fuel composition having a
viscosity within $\pm 10\%$ of the original viscosity of the diesel fuel, and wherein the ratio of diesel
fuel to additive ranges from about 50:50 to 99:1 by volume, with the proviso that water is present
in the composition sufficient to form the microemulsion and with the proviso ethylene oxide

F

3596.02-2

34

PATENT
0002-2

condensation and ethylene oxide esterification products are completely eliminated [The additive of Claim 1 wherein:

in subpart (a) the alcohol of

(a)(i) is excluded

(a)(ii) is ethanol having between 0.5% and 10% water by volume of ethanol,

(a)(iii) is aqueous ethanol of subpart (a)(ii) with methanol up to 5% by volume of ethanol;

in subpart (b) the alcohol of

(b)(i) is straight- or branched-chain alcohols having between 3 and 5 carbon atoms,

(b)(ii) is straight- or branched-chain alcohols having between 6 and 12 carbon atoms,

(b)(iii) is combinations of b(i) and b(ii);

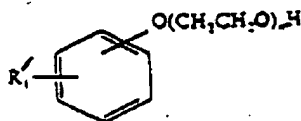
in subpart (c)

the ammonia or urea is present sufficient to neutralize about 40-80% of the fatty acid;

and with the proviso that subpart (d) is excluded.]

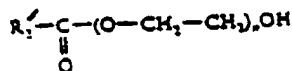
and completely eliminated are the following compounds:

the ethylene oxide condensation or esterification product formed with (i) an alkyl phenol of the formula:

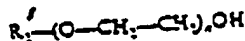


where R' is a alkyl chain having up to 8 carbon atoms and n is an integer from 5 to 20;

(ii) a fatty acid of the formula:



(iii) a fatty alcohol of the formula:



F

3596.02-2

36

PATENT
0002-2

68. (Amended) A combustible fuel composition of diesel fuel and additive as a clear microemulsion with water present wherein said additive comprises:

- (a) ethanol having between 10%-25% water by volume of ethanol;
- (b) one or more alcohols selected from the group consisting of:
 - (i) straight- or branched-chain alcohols having between 3 and 5 carbon atoms,
 - (ii) straight- or branched-chain alcohols having between 6 and 12 carbon atoms, and
 - (iii) combinations of b(i) and b(ii);

(c) a fatty acid of the structure R-(C=O)-OH, wherein R is alkyl or alkylene having between about 10 to 24 carbon atoms, in combination with ammonia or urea in an anhydrous state or as an aqueous solution and the ammonia or urea is present sufficient to neutralize about 40-80% of the fatty acid; wherein components a, b, and c, as the additive when combined with mixing with diesel fuel form a clear, stable microemulsion fuel composition having a viscosity within $\pm 10\%$ of the original viscosity of the diesel fuel, and wherein the ratio of diesel fuel to additive ranges from about 50:50 to 99:1 by volume, with the proviso that water is present in the composition sufficient to form the microemulsion and with the proviso ethylene oxide condensation and ethylene oxide esterification products are completely eliminated, [The additive of Claim 1

wherein:

in subpart (a) the alcohol of

- (a)(i) is excluded
- (a)(ii) ethanol having between 10% and 25% water by volume of ethanol,
- (a)(iii) is aqueous ethanol of subpart (a)(ii) with methanol up to 5% by volume of ethanol;

in subpart (b) the alcohol of

- (b)(i) is straight- or branched-chain alcohols having between 3 and 5 carbon atoms,
- (b)(ii) is straight- or branched-chain alcohols having between 6 and 12 carbon atoms,
- (b)(iii) is combinations of b(i) and b(ii);

in subpart (c) the ammonia or urea is present sufficient to neutralize about 40-80% of the fatty acid,

with the proviso that subpart (d) is excluded.]

and completely eliminated are the following compounds:

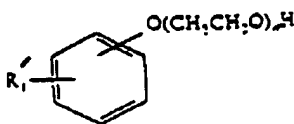
F

3596.02-2

37

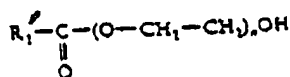
PATENT
0002-2

the ethylene oxide condensation or esterification product formed with (i) an alkyl phenol of the formula:



where R' is a alkyl chain having up to 8 carbon atoms and n is an integer from 5 to 20;

(ii) a fatty acid of the formula:

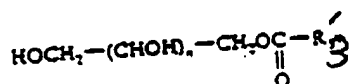


(iii) a fatty alcohol of the formula:



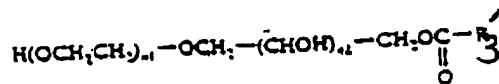
wherein R' is a long-chain, saturated or unsaturated hydrocarbon radical containing 12 to 18 carbon atoms, and n is an integer from 5 to 30;

(iv) a polyol having the formula:



wherein R' is a long-chain, saturated or unsaturated hydrocarbon radical containing 12 to 18 carbon atoms, and n is an integer from 1 to 4; or

(v) a polyol and long-chain fatty acid having the formula:



wherein R' has the meaning given above, n, is an integer from 5 to 30 and m, is an integer from 1 to 4.

69. (Amended) The additive of Claim [1] ~~68~~ wherein;

[in subpart (a) the alcohol of

(a)(i) is excluded

(a)(ii) is ethanol having between 10% and 25% water by volume of ethanol,

F

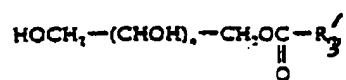
3596.02-2

35

PATENT
0002-2

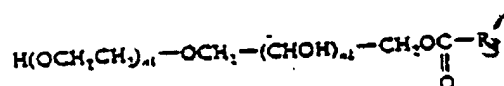
wherein R', is a long-chain, saturated or unsaturated hydrocarbon radical containing 12 to 18 carbon atoms, and n is an integer from 5 to 30;

(iv) a polyol having the formula:



wherein R', is a long-chain, saturated or unsaturated hydrocarbon radical containing 12 to 18 carbon atoms, and n is an integer from 1 to 4; or

(v) a polyol and long-chain fatty acid having the formula:



wherein R', has the meaning given above, n, is an integer from 5 to 30 and n₁ is an integer from 1 to 4.

65. (Amended) The additive of Claim [1] 64 wherein

[in subpart (a) the alcohol of

(a)(i) is excluded

(a)(ii) is ethanol having between 0.5% and 10% water by volume of ethanol,

(a)(iii) is aqueous ethanol of subpart (a)(ii) with methanol up to 5% by volume of ethanol];

in subpart (b) the alcohol [of]

(b)(i) is excluded,

(b)(ii) is straight- or branched-chain alcohols having between 6 and 12 carbon atoms, [with the proviso that] and

(b)(iii) is excluded; and

in subpart (c) the ammonia or urea is present sufficient to neutralize

about 40-80% of the fatty acid; with the proviso that subpart (d) is excluded].

66. (Amended) The additive of Claim [1] 64 wherein:

the ratio of subparts (a):(b):(c) is between about 50:40:10 to 50:25:25

67. (Amended) The additive of Claim [1] 64 wherein:

the ratio of subparts (a):(b):(c) is between about 60:30:10 to 60:20:20

F

3596.02-2

38

PATENT
0002-2

(a)(iii) is aqueous ethanol of subpart (a)(ii) with methanol up to 5% by volume of ethanol];

in subpart (b) the alcohol of

(b)(i) is excluded,

(b)(ii) is straight- or branched-chain alcohols having between 6 and 12 carbon atoms, with the proviso that

(b)(iii) is excluded[;

in subpart (c) the ammonia or urea is present sufficient to neutralize

about 40-80% of the fatty acid; with the proviso that subpart (d) is excluded].

70. (Amended) The additive of Claim [1] 68 wherein:

the ratio of subparts (a):(b):(c) is between about 50:30:20 to 50:25:25

Please cancel claims 71 to 76 and examine instead new claims 78-84.

78. (New) The additive of Claim 1 where the ratio of diesel fuel to additive is between about 80:20 to 90:10.

79. (New) The additive of Claim 1 where the ratio of diesel fuel to additive is between about 90:10 to 99:1.

80. (New) The additive of Claim 59 where the ratio of diesel fuel to additive is between about 80:20 to 90:10.

81. (New) The additive of Claim 59 where the ratio of diesel fuel to additive is between about 90:10 to 99:1.

82. (New) The additive of Claim 64 where the ratio of diesel fuel to additive is between about 80:20 to 90:10.

83. (New) The additive of Claim 64 where the ratio of diesel fuel to additive is between about 90:10 to 99:1.

84. (New) The additive of Claim 68 where the ratio of diesel fuel to additive is between about 80:20 to 99:1.

F